

Attorney's Docket No.: 00216-368004 / OB-84D

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Michael F. Roberts et al.
Serial No. : 10/036,022
Filed : December 26, 2001
Title : GUM-MASSAGING ORAL BRUSH

Art Unit : 1744
Examiner : Mark Spisich

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Handwritten: H12, ACW, 5-22-03
Stamp: FAX RECEIVED MAY 15 2003 GROUP 1700

TERMINAL DISCLAIMER UNDER 37 CFR §§3.73(b) AND 1.321(b)

Pursuant to 37 CFR §3.73(b), GILLETTE CANADA COMPANY certifies that it is the assignee of the entire right, title, and interest in the above application by virtue of an assignment from the inventors of the patent application identified above. The assignment was recorded in the Patent and Trademark Office at Reel 012436, Frame 0271 on December 26, 2001.

GILLETTE CANADA COMPANY also certifies that it is the assignee of U.S. Pat. No. 6,151,745. A copy of the assignment is attached for your reference.

The undersigned has reviewed all the documents in the chain of title of the above-identified application and to the best of undersigned's knowledge and belief, title is in GILLETTE CANADA COMPANY.

The undersigned is empowered to act on behalf of the assignee.

Pursuant to 37 CFR §1.321(b), and to obviate a double patenting rejection, the assignee identified above hereby waives and disclaims the terminal portion of the term of the entire patent to be granted upon the above identified application subsequent to the expiration date of U.S. Pat. No. 6,151,745, whereby the patent granted on this application and U.S. Pat. No. 6,151,745 will expire on the same day, provided that any patent granted on the above identified application shall

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I hereby certify under 37 CFR §1.8(n) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, Washington, D.C. 20231.

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Applicant : Michael F. Roberts et al.
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Filed : 12/26/01
Page : 2

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Massaging Oral Brush

be enforceable only for and during such period that it is commonly owned with U.S. Pat. No. 6,151,745.

The assignee identified above does not disclaim any terminal part of any patent granted on the above identified application prior to the expiration date of the full statutory term of U.S. Pat. No. 6,151,745 in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR §1.321(a), has all claims cancelled by a reexamination certificate, or is otherwise terminated prior to expiration of its statutory term, except for the separation of legal title as stated above. Assignee herein does not disclaim or otherwise affect any part of U.S. Pat. No. 6,151,745.

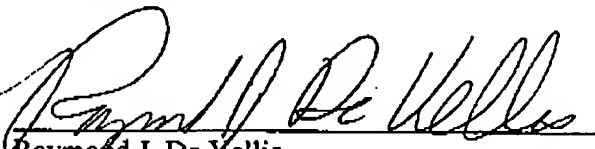
This disclaimer runs with any patent granted on the above application and is binding upon the grantee, its successors or assigns.

Please charge any additional fees, or make any credits, to Deposit Account No. 06-1050, referencing Attorney Docket No. 00216-368004.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Date: 5/13/03


Raymond J. De Vellis
GILLETTE CANADA COMPANY
Assistant Secretary

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00216_368004_terminal_disclaimer.doc

Docket No.: 00216-368004

ASSIGNMENT

In consideration of the payment of one dollar (\$1.00) and other good and valuable consideration, the receipt of which is hereby acknowledged, the below listed Assignors

Michael Roberts
12 Apache Drive
Brookfield, CT 06804

Thomas Craig Masterman
26 Linden Street
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Edward H. Park
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Scott Batson
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Stephen C. Witkus
4 Wood Avenue
Grafton, MA 01519

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hereby sell, assign and transfer to the below listed Assignee

GILLETTE CANADA COMPANY
1959 Upper Water Street
Suite 800 B3J2X2
Halifax, Nova Scotia
CANADA
(a Nova Scotia corporation)

its successors and assigns, the entire undivided right, title and interest for the United States of America and all other countries in and to the invention(s) described in United States Patent Application Serial Number 10/036,032 (docket no. 00216-368004), filed on 12/26/01, entitled **GUM-MASSAGING ORAL BRUSH**, this assignment including said application and any continuation, division, substitute, national, international, or regional application in any country which is derived or claims priority therefrom, and any patents or design registrations granted in the United States and all other countries thereon, and authorize Assignee to file patent applications and design registrations on said invention(s) worldwide in its own name and to claim priority from the aforementioned United States Patent Application under any applicable treaty or convention.

Assignors hereby covenant that no assignment, sale, agreement, or encumbrance has been or will be made or entered into which would conflict with this assignment and sale. Assignors

further covenant to provide Assignee, upon request, with all pertinent facts and documents relating to said invention(s), applications, patents and design registrations as may be known and accessible to Assignors and to promptly execute and deliver to Assignee or its legal representative any and all papers, instruments or affidavits required to file patent applications or design registrations on said invention(s) worldwide, to obtain, maintain and enforce said applications, patents or design registrations, and to transfer legal ownership of said applications, patents or design registrations to Assignee.

Assignors authorize their legal representative or the Assignee's legal representative to insert the application number and filing date in the blank spaces above if such information is unavailable at the time of execution.

Michael Roberts
Michael Roberts

County of Fairfield
State of Connecticut

On this 30th day of November, 2001, personally appeared before me, Michael Roberts, who executed this instrument of assignment as his/her free act and deed.

Amy Gaal
Notary Public

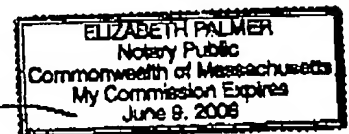
Amy Gaal, Notary Public
State of Connecticut
My Commission Expires July 31, 2003

Thomas Craig Masterman
Thomas Craig Masterman

County of Norfolk
State of Massachusetts

On this 4th day of December, 2001, personally appeared before me, Thomas Craig Masterman, who executed this instrument of assignment as his/her free act and deed.

Elizabeth Palmer
Notary Public

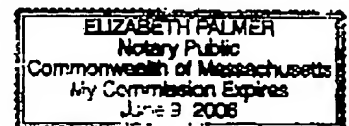


Edward H. Park
Edward H. Park

County of Norfolk
State of Massachusetts

On this 4th day of December, 2001, personally appeared before me, Edward H. Park, who executed this instrument of assignment as his/her free act and deed.

Elizabeth Palmer
Notary Public



Scott Batson
 Scott Batson

County of Middlesex
 State of Ma.

On this 12 day of December, 2001, personally
 appeared before me, Scott Batson, who executed this
 instrument of assignment as his/her free act and deed.

Wayne Buckley
 Notary Public

WAYNE BUCKLEY
 NOTARY PUBLIC
 MY COMMISSION EXPIRES
 OCTOBER 3, 2008

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Philip Sweeney
 Philip Sweeney

County of Bristol
 State of Massachusetts

On this 12 day of December, 2001, personally
 appeared before me, Philip Sweeney, who executed this
 instrument of assignment as his/her free act and deed.

Wayne Buckley
 Notary Public

WAYNE BUCKLEY
 NOTARY PUBLIC
 MY COMMISSION EXPIRES
 OCTOBER 3, 2008

Mingchih M. Tseng
 Mingchih M. Tseng

County of Norfolk
 State of Massachusetts

On this 7th day of December, 2001, personally
 appeared before me, Mingchih M. Tseng, who executed this
 instrument of assignment as his/her free act and deed.

Elizabeth Palmer
 Notary Public

ELIZABETH PALMER
 Notary Public
 Commonwealth of Massachusetts
 My Commission Expires
 June 8, 2006

Stephen C. Witkus
 Stephen C. Witkus

Worcester
 County of Worcester
 State of Ma

On this 12 day of Dec, 2001, personally
 appeared before me, Stephen C. Witkus, who executed this
 instrument of assignment as his/her free act and deed.

Wayne Buckley
 Notary Public

WAYNE BUCKLEY
 NOTARY PUBLIC
 MY COMMISSION EXPIRES
 OCTOBER 3, 2008

Accepted by Assignee

GILLETTE CANADA COMPANY

By: William J. Mostyn, III
William J. Mostyn, III
Assistant Secretary

On this 17th day of December, 2001,
personally appeared before me William J.
Mostyn, III, Assistant Secretary known to
me to be Assistant Secretary of Gillette
Canada Company, with full authority to
accept assignments on behalf, who executed
this instrument of assignment as the free act
and deed of Gillette Canada Company.

Boston, Suffolk County,
Massachusetts

Michele T. Brown-Tosi
Notary Public

Michele T. Brown-Tosi
NOTARY PUBLIC
My commission expires Oct. 22, 2005



US006151745A

United States Patent [19]**Roberts et al.**[11] **Patent Number:** **6,151,745**[45] **Date of Patent:** **Nov. 28, 2000**[54] **GUM-MASSAGING ORAL BRUSH**

[75] **Inventors:** Michael F. Roberts, Braintree, Mass.;
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(List continued on next page.)

[73] **Assignee:** Gillette Canada, Inc., Kirkland,
Canada

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[22] **Filed:** Jul. 12, 1999**Related U.S. Application Data****OTHER PUBLICATIONS**

[63] Continuation of application No. 08/730,286, Oct. 30, 1996,
Pat. No. 5,987,688, which is a continuation-in-part of appli-
cation No. 08/554,931, Nov. 9, 1995, abandoned.

[51] **Int. Cl.⁷** A46B 9/04; A46B 9/06

[52] **U.S. Cl.** 15/167.1; 15/110; 15/188;
15/207.2; 15/DIG. 6; 601/141

[58] **Field of Search** 15/110, 167.1,
15/187, 188, 207.2, DIG. 6; 601/137, 139,
141

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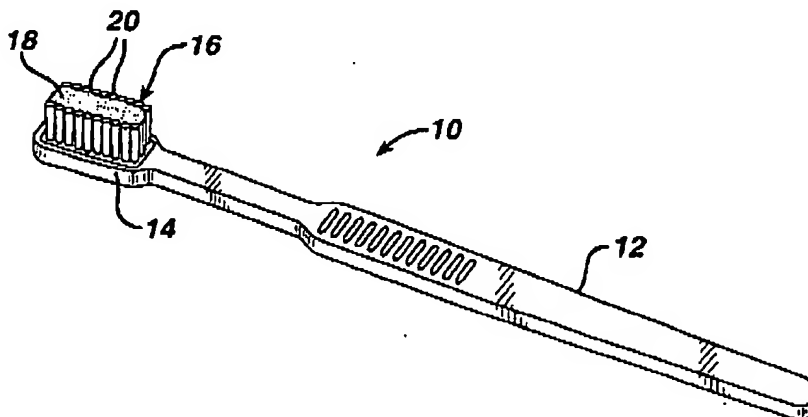
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Primary Examiner—Mark Spisich**Attorney, Agent, or Firm**—Fish & Richardson P.C.[57] **ABSTRACT**

An oral brush is provided that includes an elongated body, a head portion extending from the body, and a plurality of bristles, formed of particular thermoplastic elastomers, extending from the body. In various embodiments, the thermoplastic elastomer has a Shore A hardness of at least 30; the thermoplastic elastomer is selected from the group consisting of polyetheramides, polyesters, styrene-ethylene-butylene-styrene block copolymers, polyurethanes, polyolefin elastomers, and mixtures thereof; and the thermoplastic elastomer has a flexural modulus of at least 5 MPa.

9 Claims, 6 Drawing Sheets

6,151,745

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FIGS. 6 and 7 are perspective views of oral brushes having bristles molded to a spacer.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, a toothbrush 10 includes a plastic body having a handle 12 and a head 14 attached to a bristle portion 16.

The body of the toothbrush is formed by conventional methods well-known in the art. The handle is shaped to be grasped by a hand, but alternatively can be shaped to fit into an electric toothbrush. The configuration of the head can vary and may be rectangular, oval, diamond-shaped, or any other shape, with bristles which are trimmed flat, serrated, v-shaped, convex curved, or any other desired topography, as is well known in the art. The shape and size of handle 12 and head 14 can vary and the axes of the handle and head may be on the same or a different plane. It may be desired to provide a larger head than is conventional, in order to provide extra room for the thermoplastic elastomer bristles, while still retaining the standard number of non-elastomeric bristles.

Brush portion 16 includes a number of non-elastomeric bristles 18 and a number of elastomeric bristles 20. Preferably, as shown in FIG. 2, the non-elastomeric bristles extend from the central portion of the head 14 and the elastomeric bristles are disposed around the outer perimeter of the head 14, surrounding the non-elastomeric bristles. Another possible arrangement is shown in FIG. 3.

The non-elastomeric bristles are formed of tufts of individual filaments attached to the head in manners known to the art. The elastomeric bristles are formed of tufts of one or more filaments of thermoplastic elastomer. If a single filament is used per tuft, the filament preferably has a diameter that is half that of a standard pre-cored tuft hole, e.g., .33 mil for a .66-mil pre-cored hole, so that the filament can be folded and staple tufted into the hole.

Alternatively, some or all of the bristles are formed of a mixture of elastomeric and non-elastomeric polymers. The elastomeric material is selected from the group consisting of thermoplastic elastomers and vulcanized rubber-type polymers. In both cases, the ratio of the elastomer to the non-elastomeric material is preferably from 10:90-90:10. Preferred bristle diameters range from 3-100 mil (tapered or untapered), depending on the mixture used and elastomer and non-elastomeric material chosen as would be understood by one skilled in the art.

Suitable filaments formed of a blend of elastomeric and non-elastomeric include, but are not limited to the following:

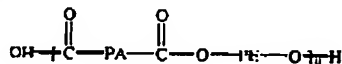
Composition	Processing Temp	Drawdown Ratio	Diameter	Bend Recovery
30% Pebax 2533 70% Zytel 151L	250° C.	4:1	8 mil	95%
30% Pebax 2533 70% Zytel 151L	250° C.	4:1	7 mil	95%

Such a mixture can be compounded using standard processing procedures such as a single screw or twin screw extruder or dry blending.

Suitable thermoplastic elastomers are those which have sufficient stiffness and hardness for effective gum massage and to resist tearing and/or excessive wear during use, while being sufficiently soft to provide comfort and avoid gum irritation during gum massage. Suitable thermoplastic elas-

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tomers include polyetheramides, e.g., PEBAX polymers (ELF Atochem); polyesters, e.g., HYTREL polymers (DuPont); styrene-ethylene-butylene-styrene block copolymers, styrene-ethylene-propylene-styrene block copolymers, styrene-butadiene-styrene block copolymers, and styrene-isoprene-styrene block copolymers, e.g., KRATON rubbers (Shell); polyurethanes, e.g., PELLETHANE polyurethanes (DOW); polyolefin elastomers, e.g., SANTOPRENE elastomers (AdVanced Elastomer Systems); and mixtures thereof. Poly(ether-amide) block copolymers having the general formula



where PA=polyamide segment and PE=polyether segment, commercially available under the tradename PEBAX polymers, are particularly preferred. Of these, a copolymer of nylon and poly(tetramethylene glycol) commercially available under the tradename PEBAX MX-1205 polymer is particularly preferred. Another preferred thermoplastic elastomer comprises a blend of a polyamide sold under the tradename PEBAX 2533 and a block copolymer sold under the tradename KRATON G-6713, preferably containing about 90% of the polyamide and 10% of the block copolymer. This blend provides good softness without tackiness or weakness.

If a relatively soft thermoplastic elastomer is used, a relatively large diameter filament may be needed to provide sufficient durability and stiffness. Such large diameter filaments preferably have a diameter less than about 200 mil, more preferably 30 to 100 mil. If a harder, stiffer thermoplastic elastomer is used, a smaller diameter filament can be used. Generally, suitable thermoplastic elastomers will have a Shore A hardness of at least 30, preferably from about 35 to 55 and a flexural modulus of from about 5 to 100 MPa.

Suitable vulcanized rubber type polymers include, but are not limited to, natural rubber, crosslinked polybutadiene, cross-linked polyacrylates, and blends thereof.

Non-elastomeric bristles 18 may be formed of any material suitable for use in toothbrush bristles. Such materials can also be used as the non-elastomeric component of elastomeric non-elastomeric blend bristles. Preferred materials include nylon 612 and other polyamides. A preferred grade of nylon is available from Whiting Co., Burlington, Vt. under the tradename WYTEX. Preferred polyamides include polythalamides sold by Amoco Performance Products, Inc., under the tradename AMODEL resins. Such polythalamides are described in U.S. Pat. Nos. 4,603,166, 4,476,280, and 4,617,342, the disclosures of which are incorporated herein by reference. A particularly preferred polyphthalamide is a crystalline polyphthalamide formed by polymerization of terephthalic acid, isophthalic acid and adipic acid with hexamethylene diamine. Other suitable filaments include acetal resins, polyesters, fluoropolymers, polyacrylates, polysulfones and combinations thereof. Preferred non-elastomeric filaments have a diameter of from about 3 to 10 mil.

In an alternate embodiment, the elastomeric bristles include a sheath 30 of thermoplastic elastomer coextruded around a core 32 of a different material, as shown in cross-section in FIG. 4. The sheath to core volume ratio may be from 95:5 to 5:95.

Preferably, the core material is a stiff polymer, allowing the outer sheath to be softer and/or allowing the bristles to have smaller diameters than would otherwise be possible (with a thermoplastic elastomer alone) due to the constraints of bristle durability and strength. If desired the coextruded filaments can have standard bristle diameters, e.g., 5-8 mil.